

Hab. Batu Sang Mount, Baram River, N. Borneo (5000 feet)*, Jan. 1892. Coll. C. Hose, Esq.

The type specimen of this striking species has unfortunately had its skull shattered by shot, so that an exact comparison with the skull of *S. Berdmorei* is impossible. At the same time enough remains to show that the muzzle is quite short, and not elongated as in the Malayan species; so that it would appear not to be a Bornean representative of that animal, as one would at first suppose. Of the short-snouted species the only one at all resembling it is *S. tristriatus*, whose South-Indian locality renders it very remarkable if *S. Hosei* really belongs to the same group. However, when fully adult specimens with perfect skulls are obtained, we may be able to determine what are its nearest allies; but in any case there can be no question as to its own specific distinction.

XXV.—*Spiders from Madeira*.

By CECIL WARBURTON, M.A., Christ's College, Cambridge.

[Plate XIV.]

THE Madeiran spiders which form the subject of the present memoir have been obtained from three distinct sources:—

1. Specimens collected by Mr. W. R. Ogilvie-Grant, Assistant in the Zoological Department of the British Museum, and placed in my hands by the courtesy of his colleague Mr. R. I. Pocock. This collection embraces thirty-two species, of which three are new to science.

2. Spiders collected by Mr. John Willis Clark, Registrary of the University of Cambridge. Of the fifteen species contained in this collection one is new to science.

3. A few specimens, comprising eight species, collected by Padre Schmidt, of Madeira, and kindly brought to me by Mr. J. W. Clark.

My thanks are due to the gentlemen above named and also to the Rev. O. Pickard-Cambridge and M. Eugène Simon, from whom I have received valuable advice with regard to some of the more obscure species.

* This altitude rests on the statement of a native.

Attidæ.

Attus maderiana, sp. n., ♀. (Pl. XIV. fig. 1.)

	millim.
Cephalothorax	2·5
Abdomen	1·5
Length of legs: 1	3·5
2	3·0
3	4·5
4	5·0

Cephalothorax dark brown, merging to black on the caput, but with a narrow white lateral border, of which the inner edge is broken by a dark spot opposite the third leg. There is a conspicuous whitish spot behind each of the posterior eyes.

The *abdomen*, which is oval, is of a blackish-brown colour, variegated with some whitish spots and some angular markings of a yellowish hue.

Three white spots on either side correspond with, but do not quite meet, the angular circumflex-like markings, and are, so to speak, encroachments of the paler border of the abdomen. The extremities of the middle angular marking are also dilated to form two conspicuous whitish spots.

In the posterior half of the abdomen the pattern is complicated by two faint angular markings each in the form of an inverted circumflex.

The under surface of the abdomen and of the coxæ is pale, but the plastron is dark brown or black. The palpi are white. All the legs are distinctly annulated on the metatarsi and tarsi, but the femora and patellæ are of dark hue, and the former have black longitudinal striations.

A single female of this small spider was taken by Mr. Grant.

Marpissa Grantii, sp. n., ♀. (Pl. XIV. figs. 2 and 3.)

	millim.
Cephalothorax	3·0
Abdomen	3·5
Length of legs: 1	5·5
2	4·0
3	4·5
4	5·0

Cephalothorax dark red-brown, with a bronze hue on the caput. The ocular area is marked by a bent transverse bar of lighter hue.

The *abdomen* is oval, slightly narrower behind; its prevailing colour is a reddish yellow, due to certain characteristic markings on a dark background. Its anterior border is whitish, and two conspicuous white spots are connected with this border by reddish bands, emphasized by a dark intermediate space. The middle of the abdomen is reddish yellow, with paler divergent markings, which are best understood by reference to the figure. The lateral borders of the abdomen are reddish yellow and give out streaks towards the median angular lines.

The *plastron* is red-brown and the underside of the abdomen is pale with a dark median longitudinal line.

The legs resemble the abdomen in colour, being of a reddish yellow, broadly but not very distinctly annulated with brown. The first pair are darker hued and very powerful, with the *tibiæ* and *metatarsi* armed with strong spines. The *palpi* are of the colour of the posterior legs.

I have named this handsome spider after Mr. W. R. Ogilvie-Grant, whose interesting collection contains three females of this species.

Marpissa ornata, Thorell. (Pl. XIV. figs. 4-6.)

Marpissa ornata, Thorell, "Descriptions of several European and North-African Spiders," K. Svensk. Vet.-Ak. Handl. xiii. no. 5, p. 60.

The collection of Mr. Grant contains a mature female spider which answers well to the description given by Thorell of the above species. As that eminent author has confined himself to a Latin diagnosis without figures, I have thought it well to include drawings of the spider in the present memoir (Pl. XIV. figs. 4, 5, and 6).

Lycosidæ.

Tarentula (Lycosa) ingens, Blackwall.

Lycosa ingens, Blackwall, "Notes on Spiders," Ann. & Mag. Nat. Hist. ser. 3, vol. xx. p. 202 (1867).

A mature female of this fine species is included in the collection of Mr. Clark, and five in that of Mr. Grant. It exhibits considerable variation in size.

Tarentula ? sp.

Two specimens, too young for identification, in the collection of Mr. Grant.

Tarentula (Lycosa) maderiana, Walckenaer.*Lycosa tarentuloides maderiana*, Walckenaer, 'Insectes aptères.'

Both sexes of this species are represented in Mr. Grant's collection.

Lycosa Herii, Thorell.*Lycosa Herii*, Thorell, "Descriptions of several European and North-African Spiders," K. Svensk. Vet.-Akad. Handl. xiii. no. 5, p. 166.

One mature female of this species was captured by Mr. Grant.

Lycosa arenicola, Cambridge.*Lycosa arenicola*, Cambridge, Ann. & Mag. Nat. Hist. 1875, vol. xvi. p. 253, pl. viii.

Mr. Clark captured several females and Mr. Grant one male of this species, which is now first recorded from Madeira.

Ocyale mirabilis, Clerck.*Ocyale mirabilis*, Clerck, Blackwall, Spiders of Great Britain and Ireland, p. 37, pl. ii.

Specimens of both sexes of this species, for the most part immature, occur in the collections of Mr. Grant and Mr. Clark. Now first recorded from Madeira.

Thomisidæ.

Xysticus cristatus, Clerck.*Xysticus cristatus*, Clerck, Sv. Spindl. p. 136, pl. vi.

Three females of this species occur in the collections of Mr. Grant and Mr. Clark. Now first recorded from Madeira.

Misumena Clarkii, sp. n., ♀. (Pl. XIV. figs. 7 and 8.)

	millim.
Cephalothorax	2·5
Abdomen	4·5
Length of legs : 1 . . .	13·0
2 . . .	13·0
3 . . .	6·0
4 . . .	6·5
	15*

Cephalothorax and legs a rich glossy yellow. An indistinct paler streak down the middle of the cephalothorax. Ocular area prominent and of a dead whitish colour. Lateral anterior eyes largest. The anterior row distinctly convex towards the front and shorter than the posterior row, which is very slightly convex, the eyes being nearly equal in size and the medians somewhat nearer together than each is to the lateral.

Abdomen probably of a vivid green in life, showing when magnified a fine black reticulation. There are numerous short spines on black prominences under the tibiae and metatarsi of the first and second pairs of legs.

I have named this spider after its discoverer, Mr. J. W. Clark, a single female being contained in his collection.

Epeiridæ.

Argiope aurelia, Savigny & Audouin.

Argiope aurelia, Savigny et Audouin, Descr. de l'Égypte, 2nd ed. xxii. p. 331, Arach. pl. i.

= *Argiope* (*Aranea*) *trifasciata*, Forsk.

This spider is represented in all three collections, that of Mr. Clark including specimens of the comparatively small male.

Epeira acalypha, Walck.

Epeira acalypha, Walck., Blackw. Spid. Gt. Brit. & Irel. p. 341, pl. xxv.

Eight females were collected by Mr. Clark and Mr. Grant. Now first recorded from Madeira.

Epeira solers, Walck.

Epeira solers, Walck., Blackw. Spid. Gt. Brit. & Irel. p. 336, pl. xxiv.

Apparently abundant in Madeira, though not hitherto recorded from that locality, Mr. Grant and Mr. Clark having both taken specimens.

Epeira cucurbitina, Clerck.

Epeira cucurbitina, Clerck, Blackw. Spid. Gt. Brit. & Irel. p. 342, pl. xxv.

A female of this species was taken by Mr. Clark, and a male, not quite mature, by Mr. Grant. Now first recorded from Madeira.

Epeira ? perplicata, Cambridge.

Epeira perplicata, Cambridge, "Spiders of Palestine," Proc. Zool. Soc. 1872, p. 300.

An immature female, probably belonging to this species, is included in Mr. Grant's collection.

Zilla x-notata, Clerck.

Araneus litera x-notatus, Clerck, Sv. Spindl. p. 46, pl. ii.

Numerous specimens of this widely distributed species were taken by Mr. Grant and Padre Schmidt. Now first recorded from Madeira.

Meta Meriannæ, Scopoli.

Meta Meriannæ, Scopoli, Ent. Carn. p. 395.

This species is well represented in Mr. Grant's collection. Now first recorded from Madeira.

Tetragnatha extensa, Linn.

Tetragnatha extensa, Linn., Blackw. Spid. Gt. Brit. & Irel. p. 367, pl. xxviii.

Mr. Grant and Mr. Clark have taken specimens of this species, which has not hitherto been recorded from Madeira.

Mithras paradoxus, C. Koch.

Mithras paradoxus, C. Koch, Herr.-Schäff. Deutschl. Ins. 123. 9.

Mr. Grant's collection contains a single female of this species. New to Madeira.

Theridionidæ.

Theridion rufolineatum, Lucas.

Theridion rufolineatum, Lucas, Explor. en Algérie, Arachn. p. 260, pl. xvi.

A single female of this species is included in Mr. Grant's collection.

Latrodectus 13-guttatus, Rossi.

Latrodectus 13-guttatus, Rossi (*Aranea 13-guttata*), Fauna Etr. ii. p. 136, pl. ix.

A female of the dark variety of this variable species was captured by Mr. Grant.

Lithyphantes nobilis, Thorell.

Lithyphantes nobilis, Thorell, "Descriptions of several European and North-African Spiders," K. Svensk. Vet.-Ak. Handl. xiii. no. 5, p. 60.

Mr. Grant's collection includes several females which I attribute to this species. I give a drawing (Pl. XIV. fig. 9) of the abdominal pattern, of which Thorell's description is as follows:—

"Antice fascia subtestacea cincto, cujus extremitates longe pone medium laterum pertinent, et in medio area oblonga, lata, inæquali, antice acuminata, pallida notato, quæ in medio maculas vel puncta duo nigro-picea ostendit, et lineis binis transversis cum fascia illa laterali utrinque conjungitur."

Lithyphantes (Latrodectus) distinctus, Blackwall.

Lithyphantes (Latrodectus) distinctus, Blackw. "Descriptions of newly discovered Spiders" &c., Ann. & Mag. Nat. Hist. ser. 3, vol. iv. p. 260 (1859).

Mr. Grant captured a single female of this species.

Pholcidæ.*Pholcus phalangeoides*, Blackw.

Pholcus phalangeoides, Blackw. Spid. Gt. Brit. & Irel. p. 208, pl. xv.

Specimens of this widely distributed species occur in each of the three collections under notice, both sexes being represented. Now first recorded from Madeira.

Agelenidæ.*Tegenaria Derhamii*, Scopoli.

Tegenaria Derhamii, Scopoli, Ent. Carn. p. 400.

Three females are included in Mr. Grant's collection. Now first recorded from Madeira.

Tegenaria Guyonii (= *T. parietina*, Frc.).

Tegenaria Guyonii, Guérin-Ménéville, Iconogr. du Règne Anim., Arachn. p. 7, pl. ii.

Several females, mostly immature, are found in all three collections under notice. New to Madeira, though recorded from the Azores &c.

Tegenaria pagana, C. Koch, 1841.

Padre Schmidt and Mr. Grant have each captured two females of this species, which has been recorded from St. Helena, but not hitherto from Madeira. (See Pl. XIV. fig. 10.)

Drassidæ.*Prosthesima*, sp.

A spider of this genus, too immature for its species to be determinable, is included in the collection of Mr. Grant, who captured it in Deserta Grande.

Drassus delinquens, Cambridge.

Drassus delinquens, Cambridge, Ann. & Mag. Nat. Hist. ser. 4, vol. xvi. p. 245, pl. viii., and ser. 5, vol. i. p. 110.

A single female of this species occurs in Mr. Grant's collection.

Clubiona decora, Blackwall.

Clubiona decora, Blackw. Ann. & Mag. Nat. Hist. ser. 3, vol. iv. (1859).

Mr. Grant captured a male *Clubiona* which I judge to belong to this species. Blackwall gives no figure, and Simon regards the synonymy of the species as uncertain. I therefore give a drawing of the abdominal pattern and of the palpus of this spider, which is apparently closely allied to *Cl. holosericea* (see Pl. XIV. figs. 11 and 12).

Dysderidæ.*Dysdera crocata*?, C. L. Koch.

Dysdera crocata, C. L. Koch, Die Arachn. v. p. 81, pl. clxvi.

An immature specimen probably belonging to this species occurs in Mr. Clark's collection.

Segestria florentina, Rossi, = *Seg. perfida*, Walck.

Segestria perfida, Walck., Blackw. Spid. Gt. Brit. & Irel. p. 373, pl. xxviii.

Though not hitherto recorded from Madeira this species appears to be abundant there, as it is represented in all three collections.

Ariadne maderiana, sp. n., ♀ (not quite mature).
(Pl. XIV. fig. 13.)

	millim.
Cephalothorax	3·5
Abdomen	3·5
Length of legs: 1	6·5
2	6·0
3	4·0
4	6·5

Cephalothorax of a nearly uniform yellow-brown, slightly darker towards the caput, which is laterally compressed. The eyes of each pair are almost contiguous, the laterals being situated on slight dark-coloured prominences.

Abdomen grey, without abdominal pattern and covered with a fine down; slightly broader and a trifle darker posteriorly.

Legs yellow, with the three terminal joints of 1 and the two terminal joints of 2 tinged with brown. All the femora are powerful, especially those of the fourth pair. There is one spine on the inner side of the femora of 1.

The tibiæ of 1 and 2 have on their undersides six or seven strong spines, some of them very long. The tibiæ of 1 are especially powerful, and hairy as well as spinous. There are two moderate spines under the tibiæ of 3; but the tibiæ of 4 are spineless.

The palpi are yellow, with the two terminal joints dark brown.

The spider here described was captured by Mr. Grant in the island of Deserta Grande. It is nearly allied to *Ariadne ionica*, Camb.*; but in that species there is no pubescence on the abdomen and the femora of the first and second pairs of legs are armed with six spines, while there are four on the femora of the third pair.

Filistatidæ.

Filistata testacea, Latreille.

Filistata testacea, Latreille, Consid. gén. p. 121.

Two females of this species were captured by Padre Schmidt. Now first recorded from Madeira.

* 'Journal of the Linnean Society,' Zool. 1873, vol. xi. p. 532.

Complete List of the Araneæ of Madeira as at present known.

ATTIDÆ.

- Salticus diligens*, Blackwall.
 — *vafer*, Blackwall.
 — *catus*, Blackwall.
 — *vigilans*, Blackwall.
- } The synonymy of these spiders is doubtful.
- Marpissa ornata*, Thorell.
 — *Grantii*, Warburton.
Attus maderiana, Warburton.

LYCOSIDÆ.

- Lycosa maderiana*, Walekenaer.
 — *ingens*, Blackwall.
 — *Herii*, Thorell.
 — *arenicola*, Cambridge. (England, Europe.)
Ocyale mirabilis, Clerck. (England, Europe.)

SPARASSIDÆ.

- Helicopsis (Olios?) maderianus*, Thorell.

THOMISIDÆ.

- Xysticus spinifer*, Blackwall.
 — *insulanus*, Thorell.
 — *cristatus*, Clerck. (England, Europe.)
Misumena Clarkii, Warburton.

EPEIRIDÆ.

- Argiope aurelia*, Sav. et Aud., = *A. trifasciata*, Forsk. (Africa.)
Epeira hortensis, Blackwall.
 — *lentiginosa*, Blackwall.
 — *acalypha*, Walek. (England, Europe.)
 — *solers*, Walek. (England, Europe.)
 — *cucurbitina*, Clerck. (England, Europe.)
 — *perplicata* (?), Cambr. (Asia.)
Zilla x-notata, Clerck. (England, Europe.)
Meta Meriannæ, Scopoli. (England, Europe.)
Tetragnatha extensa, Linn. (England, Europe, Africa.)
Mithras paradoxus, C. Koch. (England, Europe, Africa.)

ULOBORIDÆ.

- Uloborus pallens*, Blackwall.
Hyptiotes flavidus, Blackwall.
 — *dubius*, Blackwall.

THERIDIONIDÆ.

- Theridion aulicum*, C. Koch. (Europe.)
 — *luteolum*, Bl.
 — *rufolineatum*, Lucas. (England, Europe, Africa.)

Lithyphantes distinctus, Blackwall.

— *nobilis*, Thorell.

Latrodectus 13-*guttatus*, Rossi. (Europe, Asia, Africa.)

Enoplognatha mandibularis. (Europe, Africa, Asia.)

Linyphia (?) *Johnsoni*, Blackwall.

Erigone pigra, Blackwall.

Ecobius navus, Blackwall.

PHOLCIDÆ.

Pholcus phalangeoides, Blackwall. (Europe, America.)

DICTYNIDÆ.

Amaurobius affinis, Blackwall.

AGELENIDÆ.

Textrix obscura, Blackwall.

Tegenaria maderiana, Thorell.

— *pagana*, C. Koch. (Europe.)

— *parietina*, Fré., = *T. Guyonii*, Guérin-Ménéville. (England, Europe, Africa.)

— *Derhamii*, Scopoli. (England, Europe, N. America.)

DRASSIDÆ.

Drassus pictus, Thorell. (Europe.)

— *secretus*, Thorell.

— *delinquens*, Cambridge. (England.)

Prosthesima, sp. ?

Clubiona albidula, Blackwall.

— *decora*, Blackwall.

— *virgulata*, Blackwall.

Miltia (?) *lepida*, Blackwall.

SCYTOTIDÆ.

Loxosceles rufescens, Dufour. (Europe, Africa, Asia.)

Scytodes velutina, Lowe. (Africa.)

DYSDERIDÆ.

Oonops concolor, Blackwall.

Dysdera diversa, Blackwall.

— sp. ?

Segestria fiorentina, Rossi, = *S. perfida*, Walck. (Europe.)

Ariadne maderiana, Warburton.

FILISTATIDÆ.

Filistata testacea, Latreille. (Europe, Africa.)

From the foregoing list it appears that sixty-four species of spiders have at present been recorded from Madeira. Of these thirty-five are peculiar to the Madeira group, and one (*Uloborus pallens*) to those islands and the Canaries. The twenty-eight remaining species have a wider distribution,

twenty-four being known in Europe (fourteen in England), eight in Africa, three in Asia, and two in America.

It is probable that a more thorough acquaintance with the West-African fauna would reveal a much closer connexion between the Araneæ of that region and Madeira than our present knowledge shows to exist.

Bibliography.

Previous contributions to the Aranean fauna of Madeira are to be found in the following works:—

LOWE. "Descriptions of Two Species of Araneidæ, Natives of Madeira." Zoological Journal, vol. v. p. 322.

Species recorded :—*Loxosceles rufescens*, Duf., *Scytodes velutina*, Lowe.

BLACKWALL. "Descriptions of the Male of *Lycosa tarentuloides maderiana*, Walck.," &c. Ann. & Mag. Nat. Hist. vol. xx. (1857) p. 282.

——. "Descriptions of newly-discovered Spiders captured by James Yates Johnson, Esq." Ann. & Mag. Nat. Hist. (ser. 3) vol. iv. (1859).

Species recorded :—*Clubiona albidula*, *C. virgulata*, *C. decora*, *Clotho lepida*, *Textrix obscura*, *Theridion luteolum*, *Lithyphantes (Latrodectus) distinctus*, *Linyphia Johnsoni*, *Epeira diversa*, *Ep. hortensis*, *Oonops concolor*, *Æcobius navus*.

——. "Descriptions of newly-discovered Spiders from the Island of Madeira." Ann. & Mag. Nat. Hist. (ser. 3) vol. ix. (1862) p. 370.

Species recorded :—*Xysticus (Thomisus) spinifer*, *Coniflo affinis*, *Veleda pallens*, *Mithras flavidus*, *M. dubius*, *Theridion elegans*, *Nerienne pigra*, *Epeira lentiginosa*, *Tetragnatha lineata*, *Dysdera diversa*, *Æcobius navus* (with added characteristics).

——. "Notes on Spiders," &c. Ann. & Mag. Nat. Hist. 1867, xx.

Species recorded :—*Lycosa ingens* (male characteristics), *Salticus vafer*, *S. catus*, *S. sublestus*, *S. vigilans*, and other spiders not from Madeira.

N.B.—Simon professes himself unable to determine the synonymy of the species of *Salticus* here described by Blackwall. That author gives no figures, nor are his descriptions sufficient to determine with certainty to which of the genera into which the group has since been divided the several species belong.

CAMBRIDGE. "On the Habits and Distribution of *Lycosa ingens*." Ann. & Mag. Nat. Hist. 1872, vol. x. p. 448.

THORELL. "Descriptions of several European and North-African Spiders." K. Svensk. Vet.-Akad. Handl. xiii. no. 5.

Madeiran species recorded :—*Marpissa ornata*, *Lycosa Hierii*, *Helicopsis maderianus*, *Lithyphantes nobilis*, *Tegenaria maderiana*, *Drassus pictus*, *Dr. secretus*.

SIMON. "Matériaux pour servir à la faune arachnologique des Iles de l'Océan Atlantique." Annales de la Société entomologique de France, (sér. 6) vol. iii. (1883).

EXPLANATION OF PLATE XIV.

- Fig. 1. *Attus maderiana*, sp. n., ♀. Much enlarged.
 Fig. 2. *Marpissa Grantii*, sp. n., ♀. Much enlarged.
 Fig. 3. Ditto. Epigyne.
 Fig. 4. *Marpissa ornata*, Thorell, ♀.
 Fig. 5. Ditto. Side view.
 Fig. 6. Ditto. Epigyne.
 Fig. 7. *Misumena Clarkii*, sp. n., ♀. Caput, with ocular area.
 Fig. 8. Ditto. Epigyne.
 Fig. 9. *Lithyphantes nobilis*, Thorell. Dorsal view of abdomen.
 Fig. 10. *Tegenaria pagana*, C. Koch. Epigyne of ♀.
 Fig. 11. *Clubiona decora*, Blackwall, ♂. Dorsal view of abdomen.
 Fig. 12. Ditto. Palpus of ♂.
 Fig. 13. *Ariadne maderiana*, sp. n., ♀ (not quite mature). Much enlarged.

N.B.—The types of the species now described as new are deposited in the British Museum.

XXVI.—On the Preservation of Teleostean Ova.

By WALTER E. COLLINGE, St. Andrews University.

BETWEEN October 1891 and July 1892 upwards of 80,000 ova have been examined at the St. Andrews Marine Zoological Laboratory, comprising some thirty known and four or five unknown species. Upon a large number of these I have made numerous experiments with various preservatives, of which the following notes are an account of the results obtained.

Killing.

The most satisfactory results were obtained by adding to a vessel containing the ova, with about an ounce of sea-water, three or four drops of a saturated solution of picric acid, to which had been added 5 per cent. of hydrochloric acid. In this diluted solution they were allowed to remain for *not longer* than three minutes, during which time they were kept in motion by a pipette. When the ova remained for longer than the time stated, or when the solution was too strong, the yolk was generally ruptured and considerable wrinkling took place in the zona radiata. In other cases the yolk became considerably contracted. Like results ensued if they were not well washed in fresh water before being transferred to the preservative fluid. After washing in dilute alcohol $12\frac{1}{2}$ –25 per cent., a slight opacity followed. If killed in a saturated solution of corrosive sublimate 6 parts and 3 parts